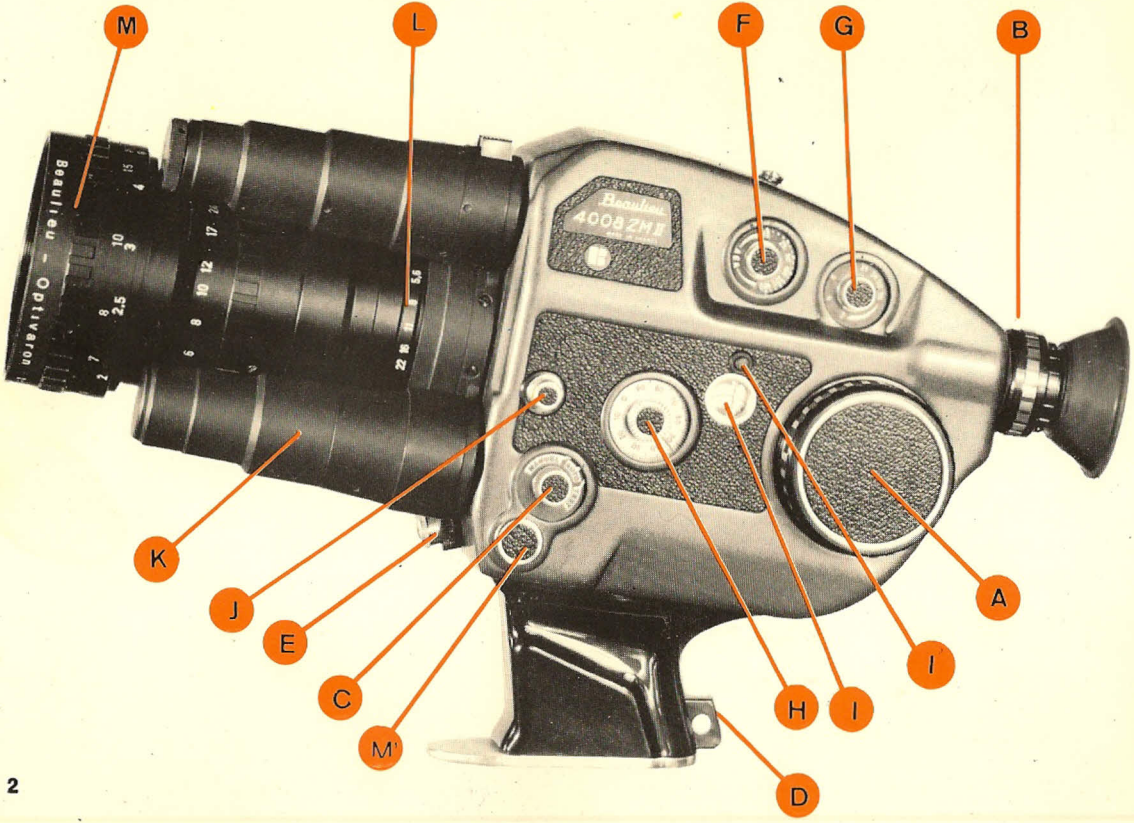
Beaulieu 4008 ZM II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Beaulieu – Optivaron
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4008 ZM II

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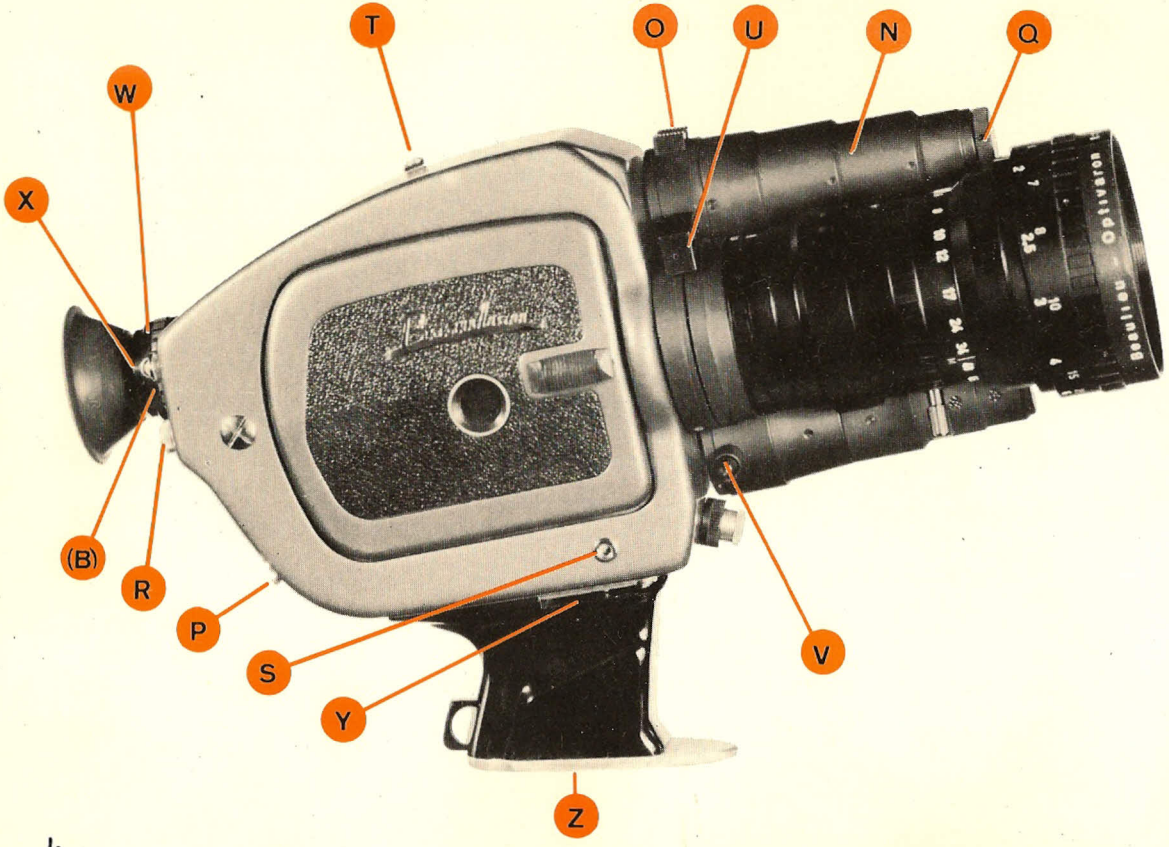
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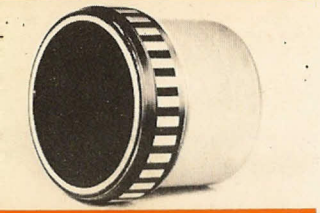

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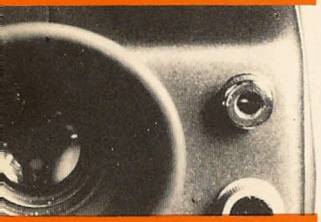

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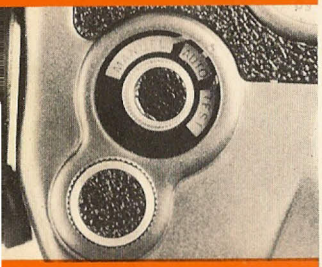

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To be sure of getting the best results from your Beaulieu camera, it is recommended that you should be perfectly familiar with its specifications and the possibilities of each of its component systems. This is why we suggest that you should first get to know the camera 4008 ZM 2 .

# PRELIMINARY DESCRIPTIONS

## A : Batteries

The camera is powered by a nickel cadmium battery The superiority of nickel-cadmium batteries lies chiefly in their delivering a constant e.m.f. with little or no maintenance, and in an extraordinarily long service life. Fully charged, they will power the camera for:

— about 7 to 10 films at 18 fps between 10° and 50 °C (50° and 122 °F) **(1)** ;
— about two films at 18 fps at — 10 °C (14 °F).

## B : Battery charging socket

This socket is intended to accept the plug of the charger supplied with the camera, or that of the special DC charging unit, when the batteries periodically have to be charged **(2)**.

## C : Master Switch

This has three positions: "Auto", "Manuel", and "Test". These three positions correspond to the following uses **(3)**.

**"Auto"**
Position to be used if the camera is fitted with the basic Beaulieu Reglomatic lens (automatic diaphragm). In this case, leave the switch in this position almost always.

**"Manuel"**
To be used when it is desired to uncouple the automatic diaphragm control (Reglomatic). Most useful when a scene has zones of too sharply contrasted lighting which might have an unfavourable influence on the cell's reactions and thus vitiate the exposure of the subject to be filmed (carefully read the hints on page **31**).

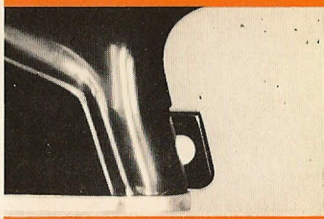
**"Test"**
This position is used in checking battery charge.

## D : Three-position power supply switch

This power switch controls the use of the camera: it has three positions:

**A Normal position**
The switch plunger is free; at the moment of filming, it must be depressed with the palm of the hand, thus establishing electric contact. Then, on pressing the release button, the camera starts filming (switch set to "Auto" or "Manuel"). To stop, first lift the finger from the push-button release; then relax the pressure exerted on the plunger: this breaks the electric circuit.

**Note.**- In no case must the camera's action be stopped by first releasing the plunger, or the electric circuit will be broken no matter what the shutter's position. On the contrary, by first releasing the push-button release, the camera stops with the shutter closed, thus avoiding any risk of fogging. The plunger can then be released.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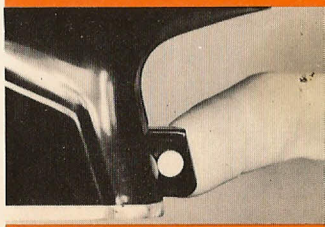
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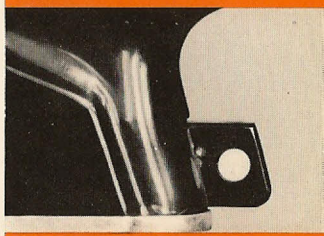
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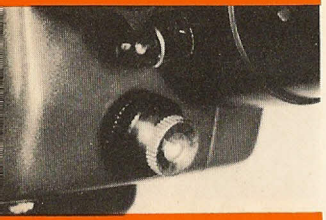

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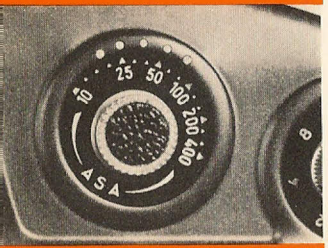
**B Safety-catch position**

Useful during travel or when the camera is carried in the hand. The plunger being in position **(A)**, pull it out slightly (without reaching the red dot) until the metal pin appears: press on the broad end of the pin, thus locking the plunger in the "off" position. To release, press on the smaller end of the pin.

**C Continuous action position (exceptional)**

For remote-control filming — by cable or radio — or for filming oneself. Pull the plunger out until the red dot appears. Permanent electric contact is established. Lock the push-button release, and control the camera's action either by radio or by means of the cable switch.

When a tripod is used for filming in position **(C)** without a remote-control device, starting and stopping must be controlled with the push-button release, either manually or with a cable release.

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## E : Release button (and cable-release socket)

This has three positions : **(7)**

— "Free": the film does not move.

— * "Depressed": this position puts the film in motion.

— * "Depressed and turned 90° clockwise": this position locks the release button and allows continuous filming.

The female thread in the center of the button receives the cable release.

* Providing the power-supply switch **(D)** is in position **(A)** or **(C)**.

## F : Emulsion-speed setting system (8)

This system makes it possible to adjust the photocell according to the sensitivity of the emulsion used.

## G : Filming-speed selector

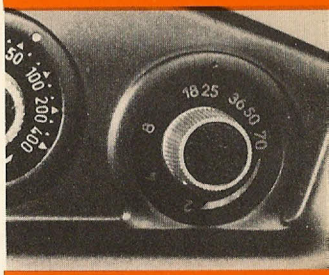
This dial makes it possible to set the camera at the desired filming speed between 2 and 70 fps **(9)**.
Since the "Reglomatic" system automatically corrects diaphragm aperture according to the shutter speed selected, it is possible to change filming speed as desired during filming: all you have to do is to adjust the speed selector knob.
For sound recording, the speed of 24 fps has a click stop, while that of 18 fps is shown by a dot.

**Important note**
Never use the camera without film at more than 24 frames per second.

## H : Frame counter

This counter, graduated from 0 to 100, gives a count of the number of frames running behind the lens; the milled knob in the center is a zero-reset knob. It is used when a sequence of a specific number of frames is desired **(10)**.



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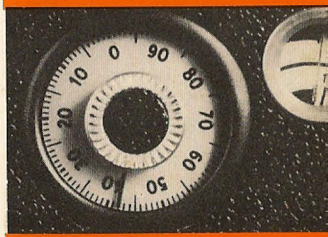


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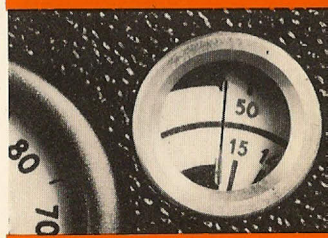


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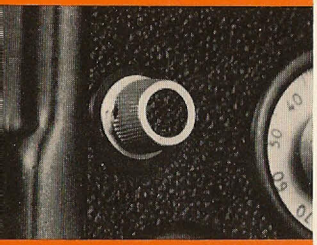

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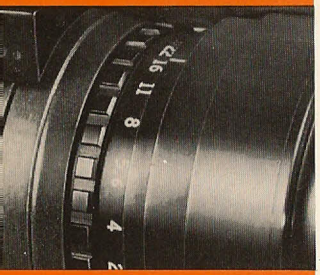

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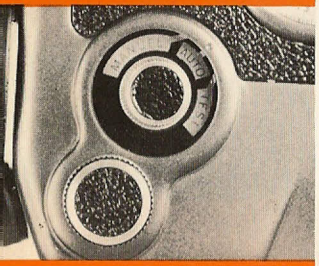

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## I : Footage counter

This indicates the footage still available, both in meters (lower scale) and in feet (upper scale). Zero is automatically re-set when the camera is unloaded **(11)**.

## I' : Film wind locking button

This button is to be depressed when achieving superimposition or lap-dissolves (refer to p. 48)

CAUTION : Be careful not to depress this button when normally shooting.

## J : Focussing-screen retracting knob

This makes it possible to interpose or to retract a ground glass screen between the eye and the lens. The advantage of the screen is that it gives the operator an accurate appreciation of focus and the depth of focus available with the aperture used. It allows special soft-focus effects.

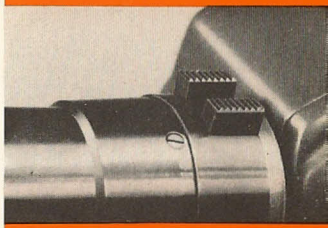
The screen can be retracted by the actuating knob The image is then only virtual and focussing is less precise. This method is to be preferred when the operator attaches greater importance to luminous viewing than to pinpoint focus (filming at infinity with high-sensitivity film and a very small aperture, poorly-lit subjects, endoscopic pictures, microcinematography, etc. **(12)**.

## K : Automatic diaphragm control system (Reglomatic)

The Reglomatic device ensures automatic diaphragm control according to the amount of light transmitted to the photocell by the reflex viewfinder; it acts directly on the iris diaphragm of the lens (whence its strength and reliability, and better definition of the resulting picture). The automatic lens can be removed from the camera, and replaced by non-automatic lenses.

## L : Manual diaphragm-setting ring

This ring controls the amount of light admitted. It is driven by a micro-motor controlled by a transistorized system which interprets the variations in the light received by the reflex cell. **(13)**.
When the master switch is in the "Auto" position, this ring turns by itself and stops when the ideal exposure value has been reached. When the master switch is set to "Manuel", this ring has to be set by hand according to the data given by the cell (pointer in the viewfinder).



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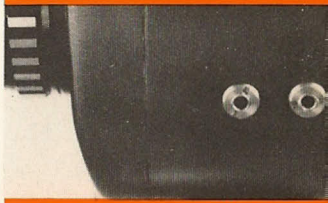
## M : Focussing ring

This hand-controlled ring is used to focus the image according to filming distance.



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## M' : Sound synchronization socket :

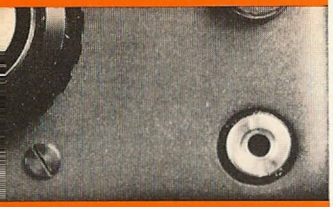
According to the type of recording system chosen (Piloton, AS. 2000* or Erlson), sound-picture synchronization is achieved by plugging into this socket **(14)** a synchro-pilot or a contact switch connected to a tape recorder.
The reverse wind device is also plugged into this socket, if superimposition or lap-dissolves are desired.

* *Val-d'Oise Electronic, 120, rue Gabriel-Péri, 95 - Bezons - France*

## N : Electric zoom

This electric zoom (convertible to manual when the master switch is set to "Manuel") makes it possible to vary the focal length of the lens between 6 and 66 mm with perfect smoothness.

17



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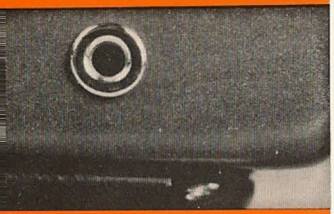

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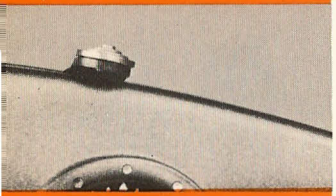

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## O : Electric zoom control contacts

The left-hand contact button (when the camera is held up for viewing) shortens the focal length (i.e. brings it towards the wide-angle, 6 mm position).
The right-hand contact operates the focal-length adjustment motor in the reverse direction (i.e. towards the "telephoto" position – 66 mm **(15).**
These two micro-switches are fitted with an instantaneous start stop system.

## P : Tape-recorder start/stop socket

These two sockets **(16)** are used to start and stop a tape recorder simultaneously with the camera. The connection is made by means of a control cable. The right-hand socket is used for a classic tape recorder (Philips type 220 S). The left-hand socket marked with a red dot (once the socket cover has been removed) is used to control a tape recorder with an electromagnetic "stop" system (UHER type).

## Q : Electric zooming-speed adjustment ring

To go from wide-angle to telephoto position, the focal length adjustment system takes between approximately 2 secs. (fastest speed) and about 12 secs. (slowest speed). It is moreover possible to obtain all intermediate speeds ; the arrows show the direction of greater speed (+) and slower speed (–) **(17).**

## R : Remote control release socket

This socket takes a special remote-control-lead plug **(18).**

## S : Single-frame release socket

Single-frame filming is performed with a flexible cable release screwed into this socket. The pressure applied to the release

should be as brief as possible **(19).**

## T : Variable shutter control lever

The variable shutter is a mechanical device which independently from the diaphragm, modifies the film exposure time as desired. It is thus possible to go from maximum aperture to complete black-out, permitting fade-ins and fade-outs, superimpositions and lap-dissolves. Shutter aperture variations are controlled by means of a lever **(20)** whose use is depicted on page 28.

## U : Macrocinematography control

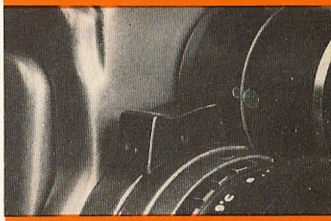
The "macro" control makes it possible to film subjects at very close ranges from 0 mm (1/25", transparent subjects or transparencies) to 1,50 m (just under 5 ft.). This control also allows soft-focus fades **(21).**

## V : Automatic maximum-aperture setting ring and telephoto lens adjustment

This button has a two position switch : **(22)**

— position 1 (light pressure): the diaphragm opens to its widest aperture of 1,8;

— position 2 (heavy pressure): the focal-length varying system automatically sets the lens to "telephoto".



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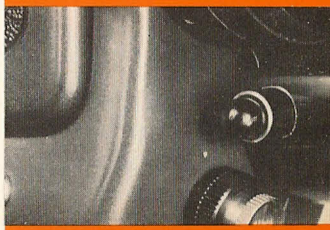

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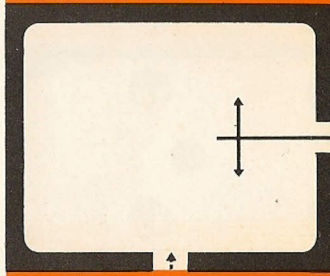

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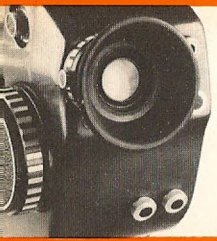

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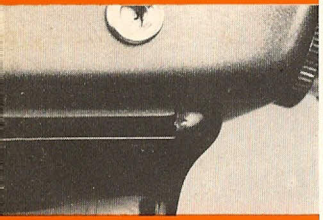
## W : Viewfinder

The Beaulieu has the largest viewfinder screen. The pointer in the viewfinder makes it possible to check exposure. In order to film under good conditions, it must remain within the notch to the right.
At the bottom of the viewing window, another notch check on film running (**23**).
When the film-running indicator ceases to flicker, this means that the film cartridge loaded has been completely exposed; it should then be replaced by a fresh cartridge.



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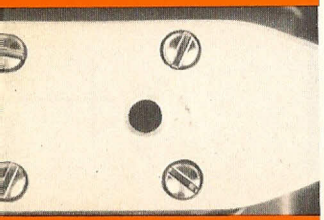
## X : Viewfinder eyepiece focussing ring

The viewfinder can be adjusted to the operator's eyesight by means of the eyepiece focussing ring. Once this adjustment has been made, the ring can be locked by means of the locking screw (**24**).



## Y : Artificial light filter-slide slot

The slot in the pistol grip takes a flat key for filming in artificial light (**25**) .See paragraph artificial light, page **29** .

Z

## Z : Wrist-strap screw socket

This is used to fit the wrist strap to the camera's pistol grip . (**Z**)

# BEFORE FILMING

## 1° Battery-charge check

Set the master-switch to "Test". Press the three-position power switch in and look at the pointer in the viewfinder. For an accurate check, wait for 20 seconds. The pointer should settle above the index notch (should it not do so charge the battery; see page **37**). Then return the master switch to its original position. This check should be carried out periodically **(26).**

## 2° Loading the camera

Open the camera side door and slip in the film cartridge with its notches towards the front. Close the door. The reference of the type of emulsion loaded should be visible through the window. Press the release button for two seconds to check that the film is running through properly: the running indicator should move vertically in the lower notch of the viewfinder. If not, repeat the loading operation **(27)**.

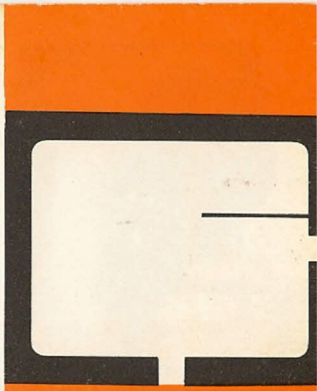
**Important**

A Wratten filter allowing daylight use of indoor color films is built into the camera. According to the type of film loaded, this filter will be either interposed or retracted thanks to the notches on the film cartridges. If artificial lighting is to be used (lamps, floodlights, etc.), see the paragraph on Filming in artificial light

## 3° Holding the camera

When the camera is hand-held, the three-position power supply switch is depressed by the heel of the hand. This means that the camera is powered. In order to film, it is therefore only necessary to hold the pistol grip and to squeeze the release button (the master switch being in the "Auto" or "Manuel" position ) **(28)**.





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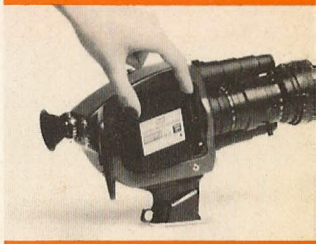

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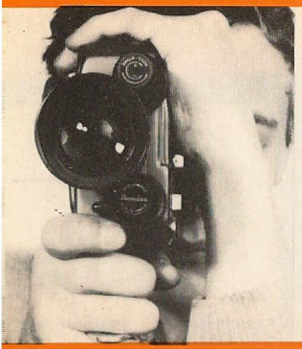

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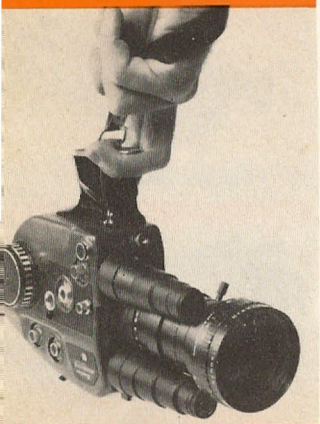


30

The pistol grip's shape is ideal, and perfectly functional for any hand, providing the camera is held as shown in photograph 28. Grasp the grip with the middle and ring fingers, placing them between the camera body and the grip base, the little finger resting on the wrist-strap screw.

## When filming with the camera

When filming at a focal length greater than 15 mm, the best way of stabilizing the camera is to hold the upper part with the free hand. It is recommended, when working without a tripod, to place the camera itself on anything that may serve as a supporting base, or to weigh the full weight of the body against some fixed structure **(29).**

## When carrying the camera at arm's length

Screw the wrist-strap tight into its socket with a coin. Slip your wrist through the strap loop as shown in photograph 30. The camera is thus maintained by your middle finger. The base-plate projecting from the grip acts as a hook-support, and allows you to carry the camera without fatigue. **(30)**

**Important**

Let us again stress that never must the camera be stopped by releasing the power switch first, for in this case the power circuit is cut and the shutter may stop in any position, which may lead to fogging On the contrary, if the release button is freed first, the camera will stop with shutter closed, thus obviating any risk of a white frame The power switch should only be released later.
This power-supply switch also acts as a safety device. In the "rest" position, the power supply circuit is interrupted.

## 4° Adjusting the viewfinder eyepiece

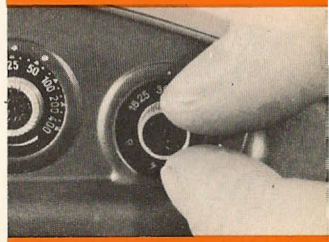
The zoom being in the wide-angle position (6 mm in the case of the standard lens), and the focussing ring set to infinity open the diaphragm to maximum aperture and put the ground glass screen in place by means of the knob. Aim at an object over 150 ft distant and rotate the eyepiece ring until the subject is perfectly sharp on the screen.
The viewfinder is now adjusted once and for all An operator who usually wears glasses can, for more comfortable viewing, remove them and focus with the naked eye in accordance with his own eyesight (within tolerance limits of — 2 to + 2 diopters). The eyepiece focussing ring can be locked by means of the screw **(31)**.

31

## 5° Setting filming speeds

Bring. the speed selected on the dial opposite the mark.
The 4008 ZM 2 will automatically correct diaphragm apertures; this means you can change filming speed as you wish while filming.
Normal filming speed is 18 fps. If this speed is decreased, an accelerated motion will appear on projection; this becomes very great when filming is done at 2 fps. (ninefold acceleration) **(32)**.
If this speed is increased to between 18 and 70 fps., slow-motion effects making it possible to break down and analyze movements are obtained (a pole-vaulter, for example).

**The speed of two fps.**
— allows filming under very poor lighting conditions (church interiors) without addition of artificial lighting, since the exposure time at this speed is very long: 1/7 second;
— makes it possible to analyze very slow movements. Example: a watch filmed at two fps will, on projecting the film, give a quite extraordinary effect, the seconds hand completing a revolution



32

(i.e. one minute) in just over six seconds. If projection is continued for one minute, the minutes hand will move through nine minutes on the watch dial.

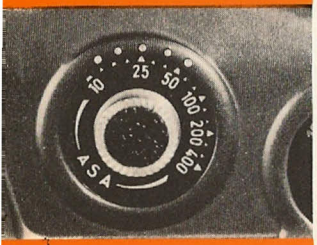
In order to film at speeds slower than eight fps, the camera has to be put on a tripod, and the "Manuel" position on the master switch has to be used.

The filming speed of 24 fps is preferable to that of 18 fps when taking panning shots of landscapes or monuments (with vertical columns), for jerkiness is thus reduced; it is also most useful for shots intended for sound-track accompaniment. The 4008 ZM 2 cameras offer the use of all intermediate speeds between 2 and 70 fps.

DO NOT FORGET: Never use the camera without film at more than 24 frames/sec.

## TABLE OF EXPOSURE TIMES DURING NORMAL FILMING AT VARIOUS SPEEDS

| | | | |
|---|---|---|---|
| 2 | f.p.s. | = | 1/7 second |
| 4 | f.p.s. | = | 1/15 second |
| 8 | f.p.s. | = | 1/30 second |
| 18 | f.p.s. | = | 1/65 second |
| 25 | f.p.s. | = | 1/87 second |
| 36 | f.p.s. | = | 1/130 second |
| 50 | f.p.s. | = | 1/175 second |
| 70 | f.p.s. | = | 1/250 second |




33

If filming with the shutter half open , divide exposure times by 2. (E.g.: 18 f.p.s. = 1/130 second. For single-frame filming, see page **27**).

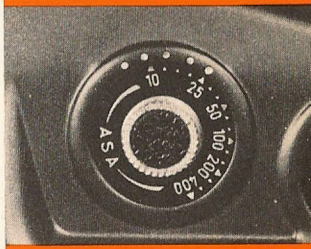
## 6° Setting emulsion-speed values

Green dot: set against this the sensitivity of the emulsion used **(33)** (black-and-white or color film).
**Caution:** For outdoor filming with "indoor" type film, the "daylight speed" should be set opposite the green dot.
Example: For Kodachrome II type A film, set 25 ASA for outdoor filming (daylight).
A correction of this calibration can be effected in the proportion of plus or minus 1/2 or 1 diaphragm number.

— In order to overexpose, set a film speed tending towards the white dots.
— The first white dot gives you an overexposure of 1/2 diaphragm value **(34)**.
— The second white dot gives an overexposure of 1 full diaphragm value **(34)**.
— In order to underexpose, set a film speed tending towards the red dots:
— The first red dot gives an underexposure of 1/2 diaphragm value **(35)**.
— The second red dot gives an underexposure of 1 full diaphragm value **(35)**.

## 7° Use of the automatic diaphragm

— Set the master switch to "Auto".
— Take the camera in hand and depress the power-supply switch. According to the amount of light received, the galvanometer pointer will move in the viewfinder, giving a check of automatic operation



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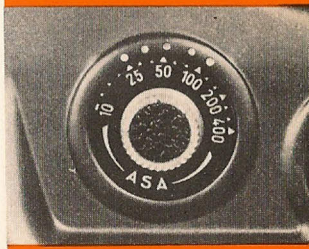


35

**Position of the pointer needle:**
— Within the notch: exposure satisfactory.
— Above the notch: risk of overexposure.
— Below the notch: risk of underexposure.

**Important**
In all cases, the viewfinder needle should lie within the notch. If it does not, two possible reasons exist:
— either too much light: film with the shutter half-closed, not forgetting to divide by 2 the film sensitivity value set on the film-speed dial;
— or not enough light: choose a faster emulsion or, if the subject permits, work at a slower filming speed.

For remote-control filming, you must:
— set the camera on a tripod;
— lock the power supply switch in the continuous position "C" ;
— set the release button to the "continuous" position and use one of the remote-control devices;
— if master switch is set to auto for automatic exposure control, the ocular should be masked with a special viewfinder cap (available as an accessory).

## 8° Manual use of the diaphragm

After setting the master switch to "Manuel", sight the subject to be filmed, and bring the pointer needle in the viewfinder opposite the mark by rotating the diaphragm setting ring. The Beaulieu is ready to film.
If lighting conditions on the subject vary, rotate the ring to keep the needle within the notch.
In order to disconnect the automatic action of the Reglomatic, just set the master switch to "Manuel" and proceed as for non-automatic

lenses (see below). The Beaulieu's reflex cell, which lies behind the lens, gives accurate data no matter what the optical equipment: it is thus possible, with 4008 ZM 2 cameras, to use any standard "C"-mount cine lenses, most still miniature camera lenses, and all filters.
Correction is automatic.

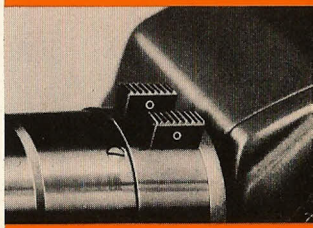
## 9° Framing and focussing

The viewfinder eyepiece being once and for all adiusted to the operator's eyesight, the subject should be sharp on the screen, for the image viewed is that which will be filmed. To achieve this, all that need be done is to rotate the lens focussing ring until the image on the screen is in perfect focus. It is necessary that this adjustment be made at maximum aperture and with the focal-length adjustment in the "telephoto" position with the 4008 ZM 2 , in order to obtain both these positions simultaneously, just depress button V to maximum depth.
Once this adjustment has been made, any focal lengths (set by electric or manual control) can be used without having to adjust the focus.

## 10° Use of the electric zoom

The focal length adjustment device (zoom) on the Beaulieu 4008 ZM 2 is electrically actuated. Passage from wide-angle position to telephoto position, and vice versa, is simply effected by pressing on switch O or switch O' **(36).**
Switch O drives the lens towards the telephoto position.





Switch O' drives it towards the wide-angle position.
The time for extreme changes in focal lengths is from about 2 secs. to about 12 secs.
The adjustment ring Q merely has to be set accordingly.

## 11° Unloading the camera

In Beaulieu cameras, the end of the film is shown by the cessation of the flicker-indicator in the lower part of the viewfinder. Open the side door and take out the cartridge. The word "exposed" should appear on the film itself; this is a certain identification of an exposed film, and avoids re-loading the camera with an already-exposed film.

**CAUTION.** - When removing a partly-exposed cartridge, 7 frames are fogged and the footage counter automatically returns to 15 m/50 ft. If it is imperative that cartridges should be changed the length of unexposed film still available should be noted on the label in such a position that it can be read through the side-door window when the film comes to be loaded once more.
This figure will allow the operator to correct the footage counter's indications and to be certain of the amount of film still unexposed.

**IMPORTANT.** - After filming, make quite certain the power-supply switch is in position A (normal). Never leave this switch in position C when not in use: you would run the risk of completely discharging the battery. This switch should permanently be kept in positions A or B both of which automatically interrupt the battery power circuit.

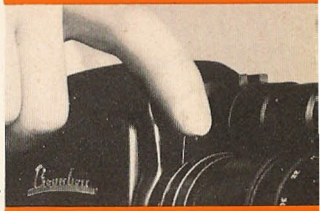
# SPECIAL USES

## 1° Macrocinematography

Without the special "Macro" system, you can film as close as three feet from any object.
But, closer than this, the new Macrocinematographic system of the 4008 ZM2 avoids the use of special lenses and extension tubes. It makes it possible to film from distances of 0 mm (transparent slides, phototransparencies, etc.) up to 1,50 m (in other words, from 0 inch to five feet).

**Operations to be performed before "macro" focussing:**
— Fit the camera on its tripod.
— Make certain the ground glass screen is positioned.
— Free the "Macro" slide by pressing on its end **(37)**, and bring it into low position in order to reach the greatest magnification ratios **(38)**.
— Set the zoom to "low speed".
— Set the master switch to "Manuel", so as to be able to open the diaphragm to full aperture, by hand.

**Note.** - The position of the distance ring has only a very slight effect on macro focussing (preferably set it at infinity).
According to the subject to be filmed, focussing is performed by using:
— either the electric zoom switches;
— or the "macro" knob itself (more particularly when seeking smaller magnification ratios);
— or by moving the camera towards or away from the subject.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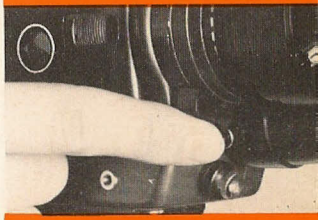
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The "Macro" slide being in its "low" position, here are a few "Macro" positions between 0 and 1,50 m ( 0 to 59 inches).

| Distance from surface of lens to subject | Subject dimensions (mm) | position of focal length ring | position of focusing ring | Lighting |
|---|---|---|---|---|
| 0 mm | 23.5 x 17.7 | M* | to infinity | Transparency |
| 4 mm | 23.5 x 17.7 | M* | to infinity | Transparency |
| 10 mm | 25 x 18.8 | M* | to infinity | Transparency or Normal |
| 30 mm | 27 x 20.3 | 44 mm | to infinity | Normal |
| 60 mm | 29 x 21.8 | 48 mm | to infinity | Normal |
| 100 mm | 31.5 x 23.7 | 49 mm | to infinity | Normal |
| 120 mm | 33 x 24.8 | 50 mm | to infinity | Normal |

* M : "Macro-Maxi" position, located by red markings on the focal length ring

**IMPORTANT.** - After filming "Macro" sequences, do not forget to return the "Macro" slide to its initial position.
**Note.** - It is also possible to obtain soft-focus fade-ins or fade-outs by lowering or raising the "Macro" slide while filming.

## 2° Microcinemotagraphy

For microcinematographic uses, Beaulieu has designed a special set of connecting rings and extension tubes to be used according to the magnification ratios desired. The camera, once its normal lens

has been removed, is directly fitted to the microscope eyepiece by means of these connecting rings and extension tubes. For preference, focussing is done on a virtual image. For this type of work, the built-in photocell proves a tremendous advantage for, as in all other cases, all that has to be done is to bring the viewfinder needle opposite its mark by acting, on the one hand, on filming speed and, on the other, on the microscope's light source.

## 3° Single-frame filming

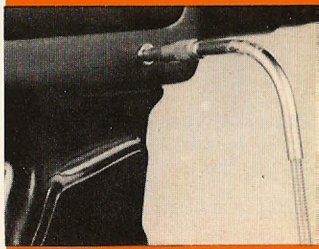
Frame-by-frame filming is essential if one wishes to shoot animated cartoon or puppet scenes, and also to record slow-development phenomena. This type of filming cannot be effected otherwise than on a tripod, in "Manuel" position, using a flexible cable release (power switch in the continuous position "C") **(39)**.

Under these conditions, frame-exposure times are a follows:

| | | | | | |
|---|---|---|---|---|---|
| 2 fps | = | 1/7 sec. | 25 fps | = | 1/87 sec. |
| 4 fps | = | 1/15 sec. | 36 fps | = | 1/87 sec. |
| 8 fps | = | 1/30 sec. | 50 fps | = | 1/87 sec. |
| 18 fps | = | 1/65 sec. | 70 fps | = | 1/87 sec. |

(with the shutter half-open: divide the above exposure times by two: example: 1/130 sec. at 18 fps).

**Caution.** - Never lock the flexible cable release in the "continuous" position for single-frame filming. Pressure time on the cable release should be as short as possible.



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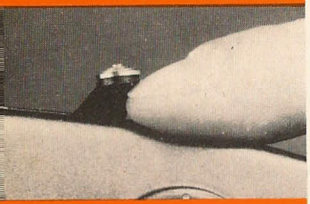

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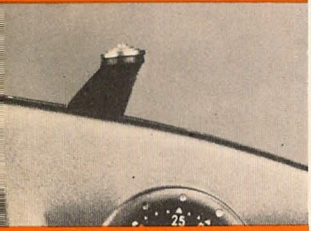

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## 4° Use of the variable shutter

The variable shutter is controlled by means of the lever located on top of the camera body. It works from rear to front to close the shutter slot **(40)**, and from front to rear to open it.

It can be locked in the half-closed position **(41)** (i.e. allowing half the normal light through), or in the fully closed position at the extreme front end of the slot **(42)** (i.e. the shutter is completed closed). In both cases, the lever is pulled upwards to lock the variable shutter.

Fades make it possible to finish a scene or a shot by gradually darkening the pictures until complete darkness is reached, or, on the contrary, to start a scene in complete darkness and gradually to lighten until a normal lighting intensity is reached. It is generally preferable that fades should be filmed with the camera on a tripod, so that no attention has to be paid to framing and the lever can be very regularly actuated in the desired time, according to the effect required (average time: 4 secs., or 72 frames under normal filming conditions).

## 5° Use of remote control

This particular facility offered by the Beaulieu cinecamera will be appreciated by all those making films calling for very discrete operation (wildlife scenes, children at play, etc.) or having a marked element of danger (wild animals, car races, scientific experiments, etc.). There are two possible control methods: line, or radio transmitter.

### LINE CONTROL

Any two-strand line can do the job providing it is fitted with a switch and an appropriate jack plug.

a) Plug the lead connection into the jack "R" **(43)**.
b) Lock the release button in the "continuous" position.
c) Put power switch in position 3.
d) Control the camera's operation by means of the switch.

Maximum length of connecting lead: 200 meters (approx. 660 ft.). In order to avoid any extraneous light, it is recommended that the viewfinder eyepiece should be covered.

**RADIO CONTROL**

Any type of single-channel receiving-transmitting radio-control systems can be used. (A single channel is enough.)

a) Plug the male receiver plug into the camera jack.
b) Lock the release in the "continuous" filming position.
c) Put power switch in position c.
d) Control the camera's operation from the transmitter station.

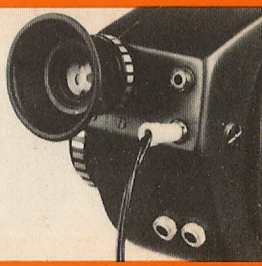
In this case also, it is recommended that the viewfinder eyepiece should be kept covered. Maximum operating distance depends on the power of the radio sets used. We strongly advise test runs before attempting filming.

**IMPORTANT NOTE.** - When under cable or radio control, the camera may stop with its shutter open or closed, or again in an intermediate position. The Reglomatic system goes on operating but, if the shutter is not completely shut when the camera is at a standstill, the diaphragm will only assume a correct position after a certain time once filming is resumed; this will lead to variable exposures in the initial frames of the sequence.

## 6° Filming in artificial light

1. Slip the key into the slot in the camera pistol grip so as to cut out the filter **(44)** ;
2. Set, opposite the green dot, the "artificial light" speed of film used.

**Example:** Type A Kodachrome II film: set the speed of 40 ASA if you wish to film indoors with "artificial light" type lighting.
**Note:** When using "daylight" type artificial lighting, use as you would outdoors:



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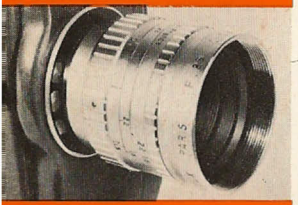

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a) The filter retraction slide should be removed from its slot;
b) The "daylight" speed of the film should be set opposite the green dot.

**Example:** A-type Kodachrome II film: set 25 ASA when you want to film in "daylight" type artificial light.

## 7° Use of non-automatic lenses

**1. Standard the 16 mm lenses "C" mount lenses**

Over and above the lenses especially designed for the Super 8 format, the 4008 ZM 2 camera will accept any object lens designed for 16-mm work (C mount: extension 17.52 mm (11/16"), - thread 25.4 mm (1") - max. thread length 3.8 mm (.15"). **(45)**

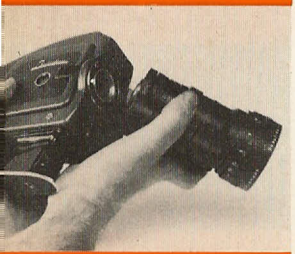
**2. Still-camera lenses**

Most interchangeable 24×36 miniature camera lenses can be fitted to the Beaulieu 4008 ZM 2 by means of intermediate adapter rings. See your Beaulieu dealer about this point.

**Fitting or removing the automatic lens**

— Unscrew the release button
— Holding the camera vertically, lens down, unscrew the lens. **(46)** **Caution:** do not hold it only by means of the Reglomatic device, but grasp the lens as far back as possible.
— To replace the lens, screw it back into place under the same conditions, then replace the release button. When replacing this button, care should be taken not to damage the screw-thread.
— Screw in the lens, without exerting too much force.

Connections between the battery and the camera film-speed-setting system are made by means of three studs and contacts situated, on the one hand, around the rear screw-thread of the lens and, on the other, on the camera body itself. These contacts must be kept absolutely clean at all times and, in particular, free from oxides.



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The camera-lens screw-thread connections are standard: if the lens is screwed in properly, a correct inter-contact position should result.

To check proper contact, press on the power switch, and see whether the automatic diaphragm is functioning as it should. Should this not be the case, adjust the lens in its C-mount so that proper contact is made.

**Note :** When using these non-automatic lenses, take into account the advice given in the paragraph entitled "Manual use of Lenses", page **22.**

**Caution :** When you change lenses (as when camera maintenance is involved, see page 52 ), never put any object into the film gate. A very thin gelatin filter lies just behind it. Should it come to be damaged, the camera would become unserviceable and would have to be completely dismantled for repair.

## 8° Use of the photocell for high-contrast scenes or subjects

The cell, on which the light rays coming through the lens impinge, is activated by the integrated luminosity of the scene in the lens field. In certain cases of very sharply contrasted scenes, the human eye will interpret these contrasts of itself; such is unfortunately not the case with a cell, whence the need for precautions if certain areas of the field are not to be over or underexposed, errors which may seem impardonable to experienced amateurs. These corrections must be applied with the Reglomatic system disconnected if the camera is so fitted. Set the master switch to "Manuel" and adjust the aperture by hand.

A/ **Wide, luminous-sky backgrounds - Snow scenes**
When the sky occupies an important part of the field covered by the lens and the foreground remains in relative shadow, the sky's brilliance will affect the cell's reactions to the point of provoking general underexposure. In such a case, one should take the precaution of aiming at a slightly lower point or at part

of the scene with medium contrast, to set the diaphragm accordingly, and only then to frame the picture as desired. The converse precaution may prove necessary on a snowfield if the sun's glare is particularly strong.

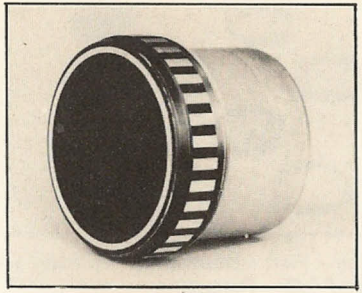
B/ **Dark backgrounds**
When the subject in the foreground is particularly bright against a dark background, the main subject risks overexposure. In such cases, the light value should be measured before filming by bringing the camera as close as possible to the subject or by setting the zoom lens to "telephoto", so that the main subject occupies the major of the field. Once the aperture is set, come back to the filming position and frame the scene as desired.

C/ **Intense source of light in the field**
A bright electric light, a brilliantly-lit window, must be left outside the field when measuring light intensity.

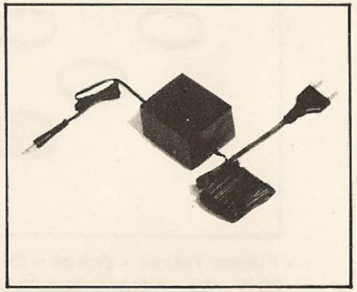
D/ **Filming against the light**
Unless systematically aiming at a dark silhouette effect against a light background, details of the subject can be obtained by measuring light intensity on a shaded part of the subject (lens set to maximum focal length and light measured as close as possible).

# LIST OF SUPER 8 ACCESSORIES adaptable to the Beaulieu 4008 ZM 2

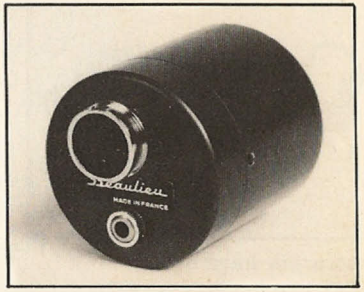
## POWER SUPPLY



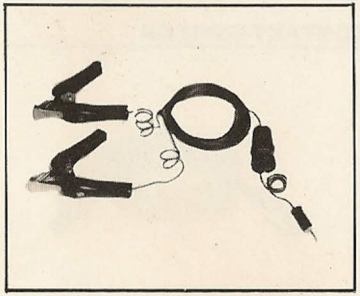
- 250 mA, 7.2 V accumulator battery



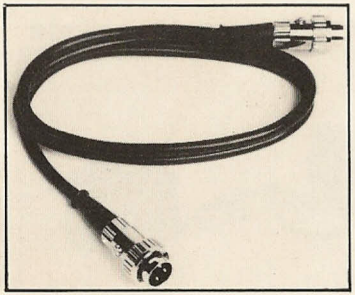
- standard 30 mA, 7.2 V charger



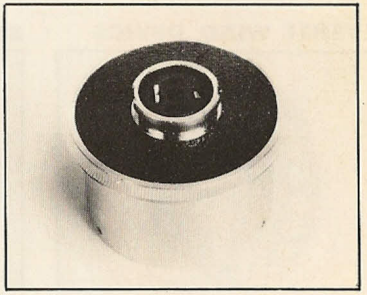

- independent charging box container



- connecting cord for charging from a 12-V car battery (with crocodile clips)

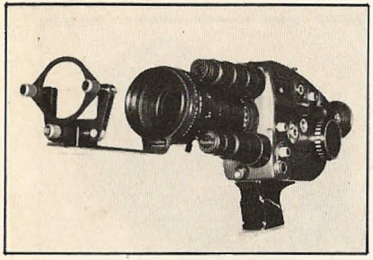


- connecting cord



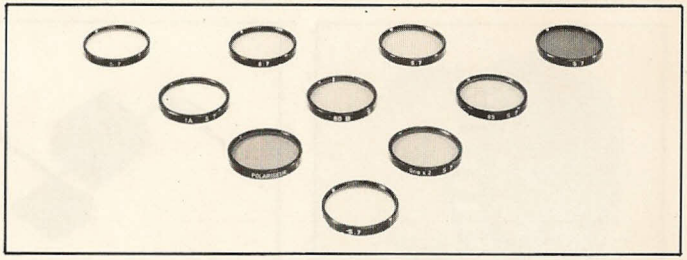
- contact plug

## MACROCINEMATOGRAPHY



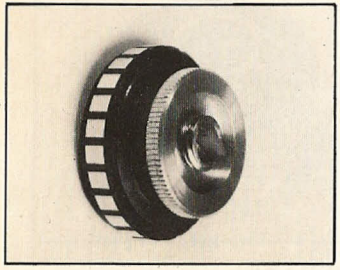
- macrocine stage
(Slide/title holder assembly)

## FILTERS for 11 × 6 lenses with PFF (series 8,5)



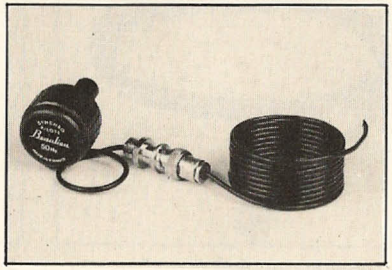
- **Filters** Yellow - Green - Orange - Red - Ultraviolet - Wratten 1A - 80 B - 85 - Neutral grey 0.30 and 0.60 - Polarizing

## REVERSE WIND DEVICE



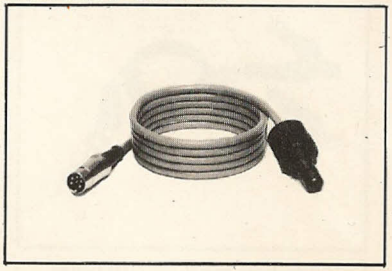
— for superimpositions and lap dissolves

## SYNCHRO-PILOT GENERATOR



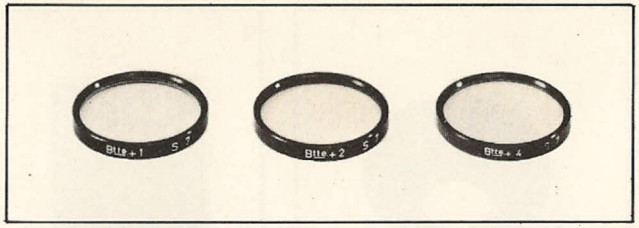
— for Piloton or AS 2000. sync sound-type

## CONTACT-SWITCH



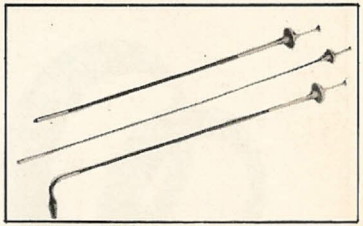
— for Erlson recording system

**PORTRAIT-LENSES** for 11 × 6 lenses with PFF (series 8,5)



- **Portrait lenses** 1 d - 2 d - 4 d

**CABLE RELEASES**



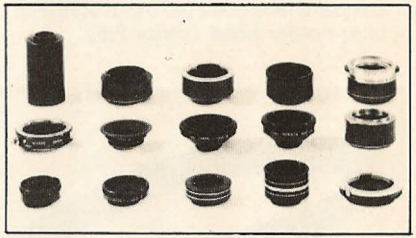
- 50 cm (20") straight
- 24 cm (9 ½") "
- 30 cm (12") curved

**CASES**

- Large luxury model hold-all type case, smooth leather

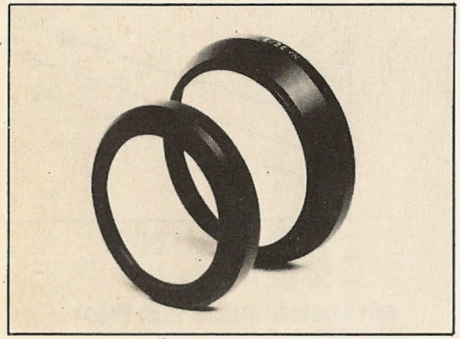
- Small-size hold-all type case, grained leather

**EXTENSION RINGS FOR PHOTO LENSES :**



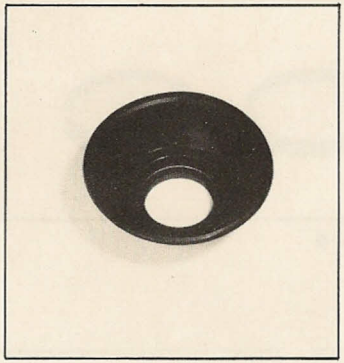
● LEICA (screw type) ● LEICA (bayonet type) ● EDIXA ● ROBOT-ROYAL ● CONTAREX ● PAXETTE ● PRACTINA ● EXACTA ● RETINA REFLEX'S ● BESSAMATIC ● LEICAFLEX ● MINOLTA ● FOCA (screw type) ● CANON PELLIX ● NIKON (with E2 ring) ● NIKON (without E2 ring) ● ICAREX ● TELYT-LEITZ

## LENS HOODS



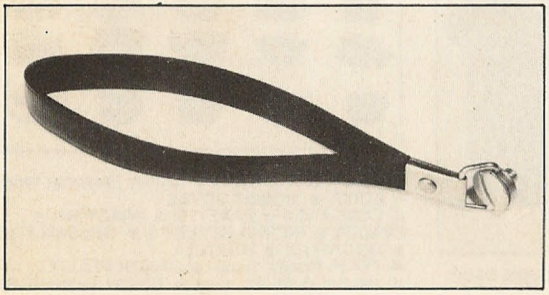
· standard lens hood (46.5 mm screw-in type
- filter-holder hood (series 8,5)

## MISCELLANEOUS

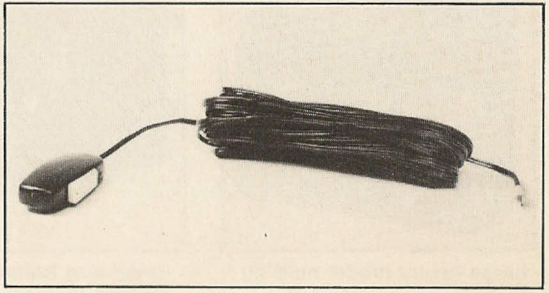


· screw-in rubber eyecup

- filter-retracting key



- carrying strap (wrist-strap)



- 10 m (33 ft remotes control cable

# USE OF THE ACCESSORIES

## 1° Battery charger for use on wall-socket mains

The battery is made up of 6 nicke - cadmium accumulator cells; they are leakproof and soldered within a metal container which screws directly into the camera housing's "battery" compartment. Capacity: 250 mA/hrs. This type of battery is a standard feature on all Beaulieu cinecameras bearing serial numbers of 851.268 or over. It can be recharged from the wall socket by means of the charger unit supplied with every camera. (47)

**Procedure:**

a) place the voltage control on 110 or 220 V according to supply.
b) place the power switch in position **A** or **B.**
c) connect the charger plug with the camera jack socket.
d) plug the charger into the wall socket (AC mains only).

**IMPORTANT:**

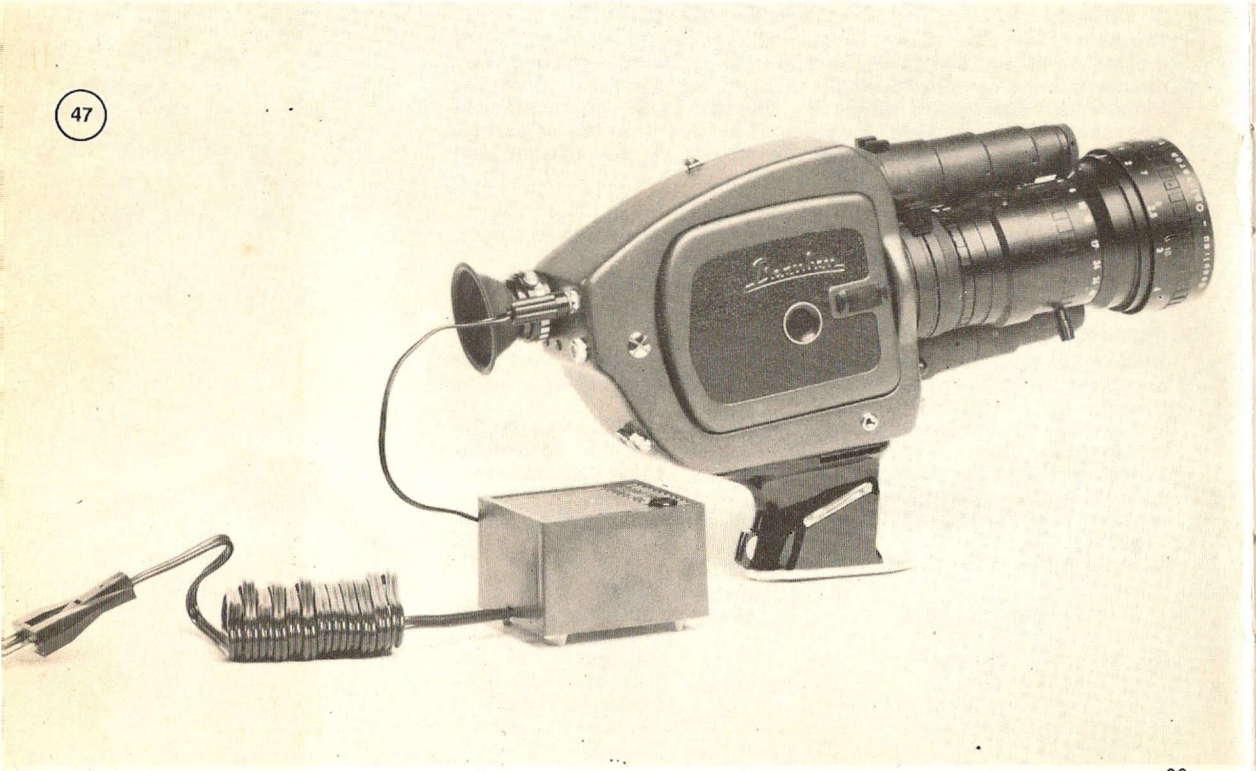
**Be sure to carry out these operations in the right order, and more especially to plug the charger into the camera jack *first*** and only therafter to connect to the mains.

The superiority of nickel-cadmium batteries essentially lies in the fact that they deliver a constant voltage, call for little or no maintenance, and have a practically unlimited life. When fully charged, they will power the camera for:

— about 7 to 10 films at 18 fps between +10° and +50 °C (50° - 122 °F).
— about 2 films at 18 fps at — 10 °C (14 °F).

**TABLE OF NORMAL CHARGING TIMES**

| After shooting | Charging time required |
|---|---|
| 2 films | 4 hours |
| 4 films | 7 hours |
| 6 films | 9 hours |
| 8 films | 11 hours |
| 10 films | 14 hours |



47

There is no danger of overcharging the battery in under 5 days. After a rest period of 1 or 2 months, charge for 20 hours.

**EXCEPTIONAL CHARGE**

Immediately after the camera's purchase, or when the batteries have not been charged for several months, it is very beneficial to "retrain" them for normal use in the following manner: charge them for 24 hours. Then let the camera run, empty, for about 10 minutes. Then charge again for 12 hours. This method is preferable to using a long consecutive charging period to put batteries left dormant and inadequately charged back into shape. In serious cases, this procedure can be repeated until the batteries are perfectly "re-educated", without any risk of overcharging them.

The only reason for this procedure is to allow the batteries to "recuperate a normal rhythm" if they have been long neglected. Once this has been achieved, resume charging according to normal charging times.

**A few hints:** To insure maximum battery life, charge them once a month when not in use.

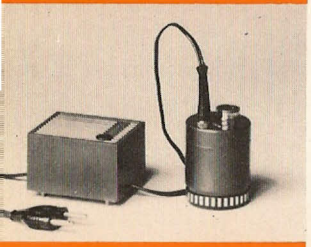
Do not hesitate to re-charge the battery after a filming session. **There is no danger of overcharging. Never leave batteries completely discharged, as this might finally put them out of action.**

## 2° Charging device for use with 12 V batteries

This accessory has been designed to charge the camera battery from the most usual types of batteries found in cars, trucks, boats, aircraft, etc.
Consisting of two crocodile clips and a 10-ft charging cord, this device is fitted with a regulator which makes it unnecessary to distinguish between positive and negative poles, so that the crocodile clips may be fitted to either battery terminal (49).
To charge the camera battery, the output lead is connected either directly to the camera jack or to the special socket on the Independent Charging and Power-Supply Container.
Charging time on 12-V battery: 12 hours.
This accessory comprises:

— 1 charging cord, with crocodile clips,
— 1 regulator,
— 1 output lead, with plug.

## 3° Independent power supply and charging container

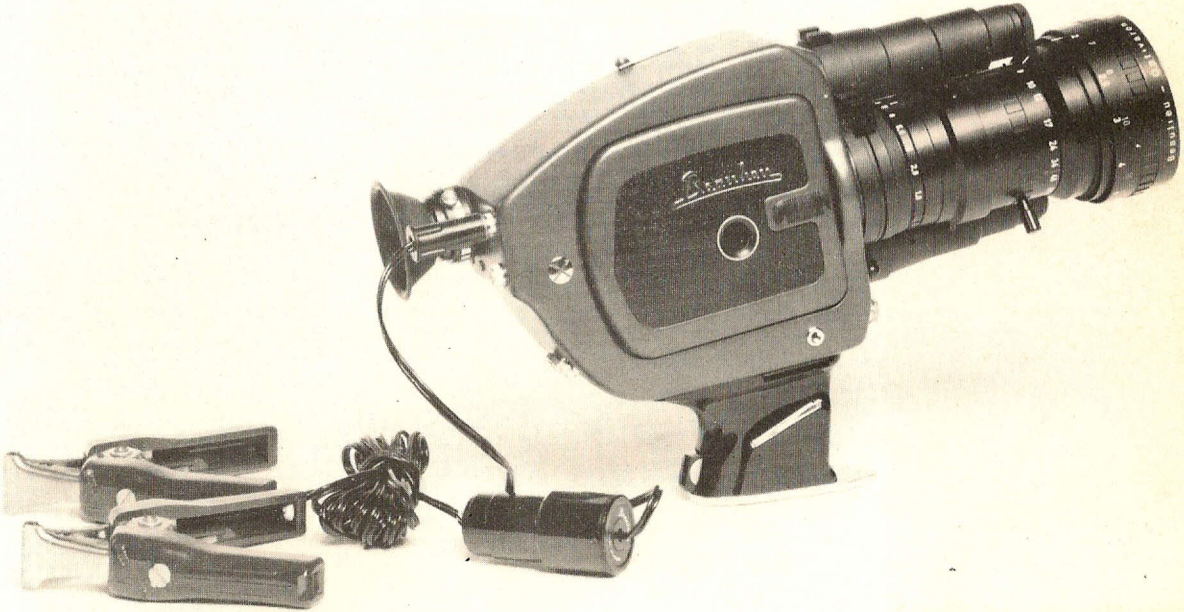


48

This accessory's function is twofold:

A **Charging the camera battery** (or a spare battery) outside the camera (48). Screwed into this container, the batteries can be charged from the mains by means of the charger supplied with the camera, or from 12-V batteries, using the special charging device described above.

49



B/ **Independent camera power-supply**

The battery screwed into the Independent Container, is connected to the camera by means of a cable and a connecting plug screwed into the empty battery housing of the camera (see photographs **(50)** .

This accessory was designed more specifically for 4008 Z M 2 owners having to film under particularly severe climatic conditions. It allows the operator to keep the battery protected from the cold by being placed in his pocket, thus insuring that maximum power remains available.

**This power-supply comprises:**

— 1 screw-in connecting plug
— 1 connecting cable
— 1 Independent container with 250-mA battery unit

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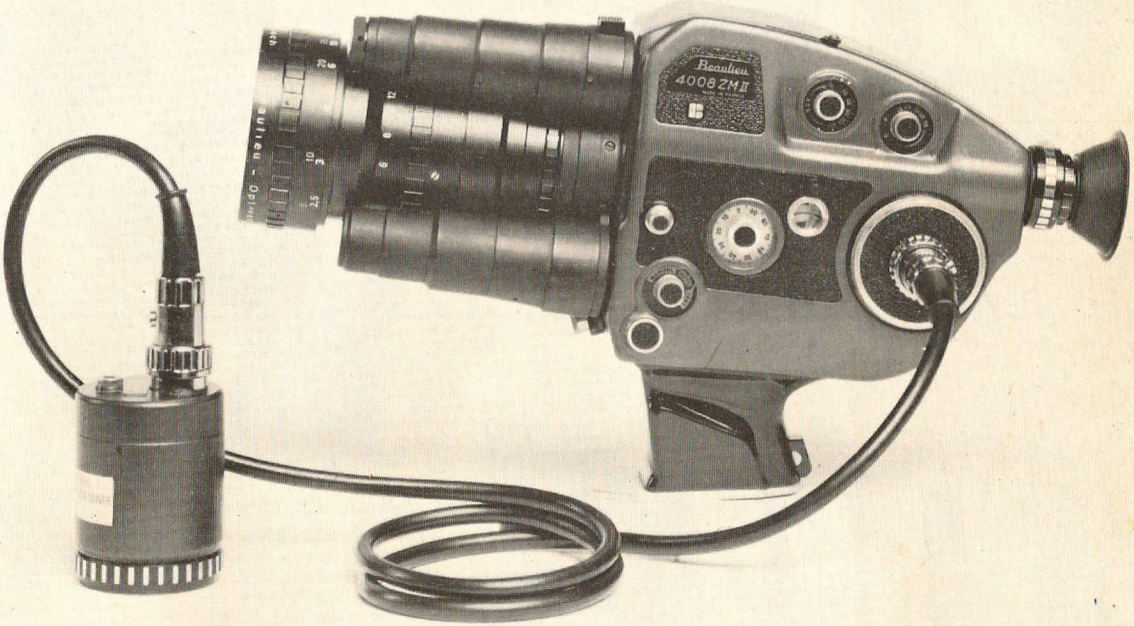

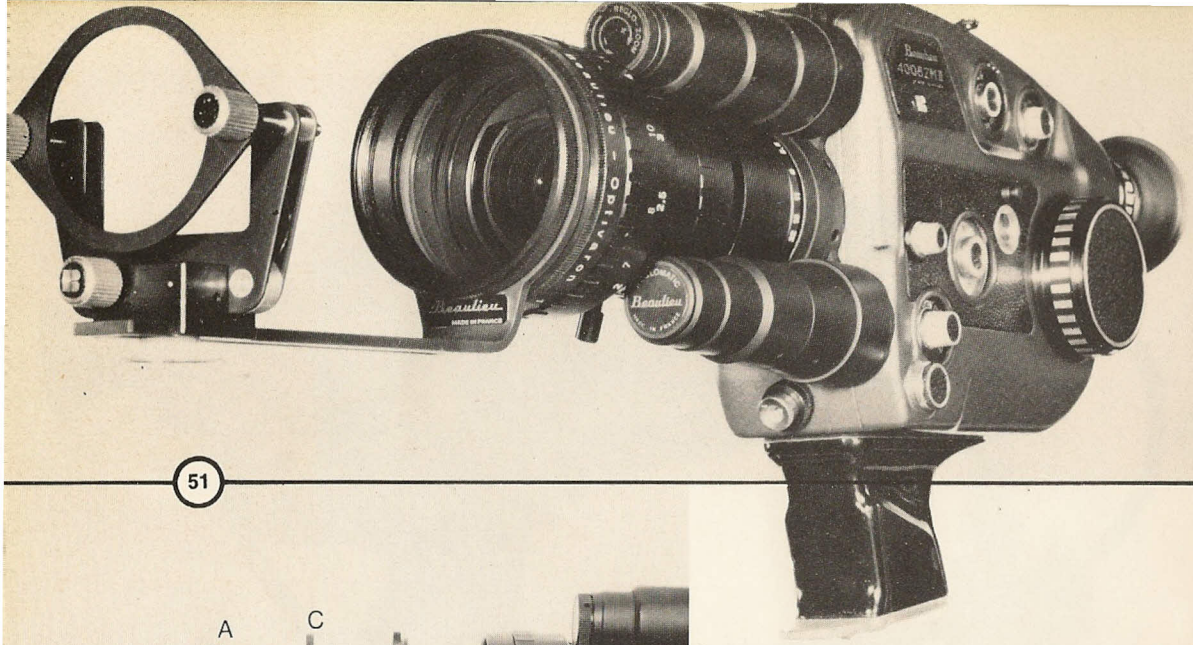


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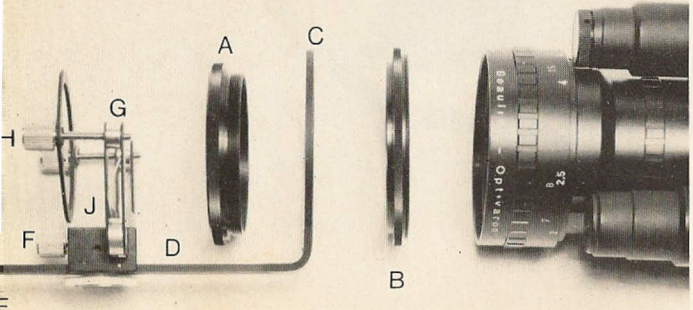



A – Front mounting ring
B – Rear mounting ring
C - Macro-stage retaining ring
D - Macro-stage distance adjustment slide
E - Slide locking screw
F - Decentering screw
G - Slide holder
H - Specimen box retaining ring
I - Macro-stage rest
J - Attachment point for specimen-box

## 4° The macro-stage (slide/title holder assembly)

This accessory has been designed by BEAULIEU to facilitate macro-cinematographic shooting at subject lens distances of between 3 and 12 cm (1.2 and 4.8 ins.) approximately. Its most common uses are filming transparencies and slides, post-cards or insects. It can also act as stabilizer when macro-filming without a tripod.

### Fitting the macro-stage to the BEAULIEU 4008 ZM 2

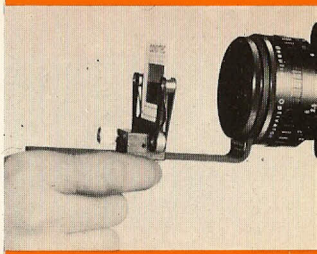
— Unscrew the two mounting rings. (front and rear rings).
— Screw these two parts back together after inserting between them the macro-stage retaining ring.
— Screw the complete assembly on to the camera (the focussing ring preferably being set at infinity) **(51)**

**Note:** For macro-filming, the focussing ring should always be left set at infinity.

### How the macro-stage works

a) Distance-adjustment slide: the macro-stage being fitted to the camera, the slide system makes it possible to move the subject forwards or backwards so as to achieve the required magnification ratio.
In order to set the distance, loosen the locking screw, slide the subject back and forth until it is in the desired position, and tighten the locking screw.

The field covered at 1.2 ins from the lens is 27 mm (1.06 in) x 20.3 mm (0.8 in) and, at 4.8 ins, 33 mm (1.3 in) x 24.8 mm (0.98 in) **(52)**



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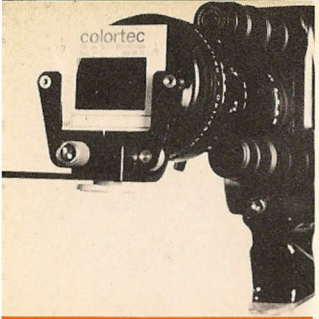


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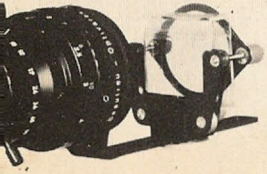
b) Decentering system: Horizontal decentering allows more accurate framing of the transparency or slide to be filmed. To adjust, undo the decentering screw and push the slide holder to the left or to the right; tighten the screw again when the desired framing has been achieved. For vertical decentering, push the slide upwards or downwards in the slide-holder grooves. **(53)**

54

**Chief uses**

a) Reproducing transparencies and slides: This is the most common use. Merely place the 24 × 36 mm, 24 × 24 mm, or 40 × 40 mm slide into the macro-stage's slide holder. **(54)**



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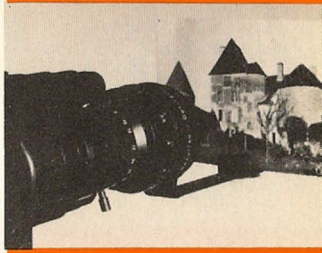
b) Filming insects, etc. :
When the object to be filmed (butterflies, moths, flies, or small fish, etc.) is placed in the specimen-box, place the box between its retaining ring and the slide holder (using the two retaining screws). **(55)**

c) Filming post-cards :
To film a detail on a post-card:
— Remove the slide holder by undoing the decentering screw.
— Slip the post-card into the slide-holder groove.
— Tighten the decentering screw on the post-card. **(56)**

d) Macro-filming without a tripod:
The subject-distance adjustment slide can also be used as a rest for macrofilming without the macro-stage (for instance, a coin). This resting point avoids having to use a tripod to stabilize the camera **(57)**



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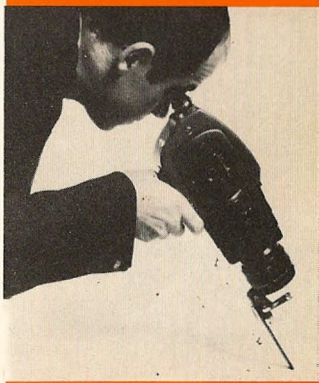

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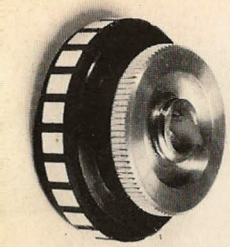

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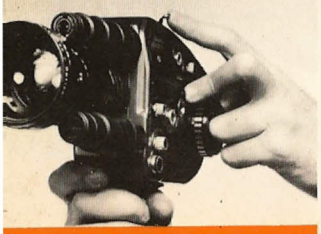


60

## 5° Reverse wind device

This attachment **(58)** is intended to achieve superimposition and lap-dissolves. It can be operated only after the film wind locking button (I' on page 2) has been momentarily depressed.
It is to be screwed into the sync socket (M' on page 2).
It is basically made up of two concentric rings : a black knurled ring ; and black ring with bright notches.
The knurled ring is for tightening the device into the M' sound sync socket, while the notched ring is intended to manually advance the film in reverse. This ring is fitted with two click-stop positions :
a) engaged : when pulled away from the knurled ring
b) disengaged : when pushed against the knurled ring

**Mounting the reverse wind device :**
— Set the shaft key so that it matches the slot of the sound sync shaft
— Screw in the device (clockwise)
— Engage the notched ring, and lock the device by turning the knurled ring. When not using the device, the notched ring should be disengaged ; otherwise, battery life would be appreciably reduced.

**Important :**
Do not run more than 100 frames (e.g. 5 seconds at 18 f.p.s. ; 4 seconds at 25 f.p.s.) while depressing the film wind locking button.
Do not depress the film wind locking button when running the camera at speeds in excess of 25 f.p.s.

## How to achieve a superimposition effect :

The purpose of the superimposition is to get a transition from one scene to the next by superimposing the beginning of a scene on the end of the preceding one. **(61)**

**Ending a scene :** (100 frame lengths, at maximum)

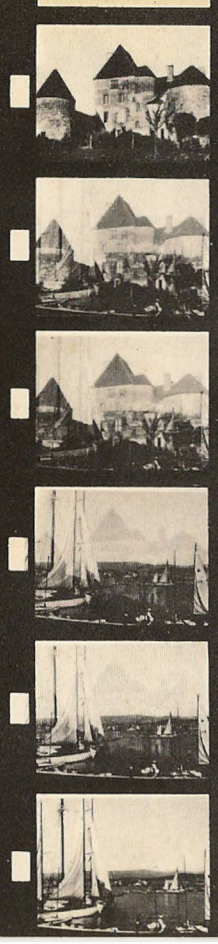
— simultaneously – lock the film wind by depressing the film wind locking button I'
– without interruption - set the variable shutter lever T in half-closed position **(60)**
— lock the lever T in half-closed position
— complete the scene and stop shooting
— Close the shutter by setting the lever T in the extreme forward position and lock it
— lock the three position power supply switch D in the safety catch position (p. 10)
— lock the release button E in continuous filming position (p. 10)
— Engage the notched ring of the reverse wind device
— Rotate the notched ring clockwise. Finger pressure on the notched ring must be just adequate to permit the film to run in reverse. Rotate until fingers slip around the ring.
— Free the release button E
— Set the Switch D to desired position

**Beginning the next scene :**

— Release the lever T, draw it back in half-closed position and lock it
— Start shooting
— Without interruption - release and draw back the lever T into the extreme backward position after a lapse of time equal to that of shooting the preceding scene with the lever in half-closed position



61



62

**How to achieve lap-dissolves :**
Lap-dissolves are intended to blend two successive scenes by superimposing one over the other during a given lapse of time, the first scene being gradually faded out while the next is gradually faded in. **(62)** Lap-dissolves are achieved by the combined operation of the variable shutter and reverse wind device.

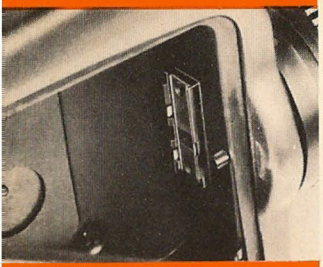
**Ending a scene** : (100 frame lengths, at maximum) **(60)**
— Depress the film wind locking button I'
— Gradually push forward the variable shutter control lever T (fade-out) until it stops
— Stop shooting
— Lock the lever T in its extreme forward position
— Lock the three position power supply switch D in the safety catch position (p. 10)
— Engage the notched ring of the reverse wind device
— Rotate the notched ring clockwise. Finger pressure on the notched ring must be just adequate to permit the film to run in reverse. Rotate until fingers slip around the ring.
— Free the release buton E
— Set the switch D to desired position

**Beginning the next scene :**
— Release the lever T, and maintain it in its extreme forward position
— Start shooting
— Gradually draw back the lever T to its extreme backward position (fade-in), within a lapse of time equal to that of fading out when completing the preceding scene.

**IMPORTANT**

— **Be careful not to depress the film wind locking button when shooting normally.**

— **Keep in mind to maintain the shutter in closed position (lever T all the way forward) when running the film in reverse.**



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# MAINTENANCE

## 1° Lens

Lens surfaces must be kept extremely clean. Outside surfaces are wiped with a fine, clean, lint-free cloth. This cloth should never be moistened. After filming, screw in the front lens cap.

## 2° Film gate (19)

The gate should be cleaned frequently (every 3 or 4 films) with the hand blower (63)

**Caution**

Never slip anything (hand blower, brush or cloth) through the gate, as this would damage the gelatin filters. To remove any possible specks of dust, blow carefully with the hand blower.

## 3° Reflex system

The mirror and focussing screen can be reached through the lens mount opening. Unscrew the lens: the mirror becomes visible. If there are dust specks on it, remove them with the hand blower.

## 4° Lubrication

This should always be left to us. After three years, it is advisable to leave the camera in the care of a Beaulieu dealer, who will overhaul it.

# ELECTRICAL DATA

## D.C. :

The camera's consumption is obviously dependent on filming speed, and lies between 200 and 500 milliamps. Normal power supply voltage: 7.2 volts.

## Rectified A.C. :

Never use the camera on the mains, even with any transformer to be found on the market, for the current must not merely be rectified, but also carefully filtered.

# A FEW USEFUL HINTS

## Focussing

In order to achieve pinpoint focussing with the ground-glass screen, it is essential to bring the zoom lens to its "telephoto" position (e.g. for the standard lens : 66 mm) and to full aperture (f 1,8 for the standard lens). Focus the image with the focussing ring. Then adjust the focal length to frame the picture exactly as desired: the image will remain perfectly sharp.

## Zoom

For focal lengths greater than 30 or 40 mm, the use of a tripod is highly advisable, for otherwise the operator's slightest movements are amplified and, on projection, the picture will be unsteady. As a general rule, use a tripod whenever possible: the film's steadiness will invariably gain by it.

## Photocell

Only shoot when the needle is in the indicator notch. If the light is too poor, use slow filming speeds (ASA compensation is built-in) when the subject is not moving.
Some sequences may have to be filmed in zones in which light-contrast is strong (beach or snow scenes, dark shadows...). When the film subject is in one of these zones (full sunlight or deep shadow), it is imperative that the cell should only react to the actual lighting in this zone alone.

To achieve this, "zoom" to maximum focal length on the subject. The cell will react accordingly. Without taking the eye from the viewfinder, set the switch to "Manuel" so as to lock the diaphragm. Then return to the required framing: the central subject will be properly exposed.
The Beaulieu's range of possibilities allows its owner to cope with practically any filming conditions. With a little practice, you will soon be using them to the fullest advantage.

## Filming speeds

Avoid running the camera empty at speeds in excess of 24 f.p.s. For complete sequences shot at 2 f.p.s. we advise setting the switch to "Manuel" in order to avoid influencing cell-response as a result of the extremely slow back-and-forth movement of the shutter.

## Super 8 cartridges

Super 8 cartridges are moulded to very fine tolerances; their plastic body is however sensitive to prolonged heat (sunshine, proximity of a fire, etc.), which might cause slight distortion liable to interfere with proper film feed.
Should the film be blocked during a take, remove the cartridge, then put it back into its housing (N.B. the footage counter will return to zero: see p. **12** paragraph **I**) and check film feed in the viewfinder. If the film remains blocked, check the film's visible perforations. If a few perforations are damaged, the film can easily be wound on a few frames by turning the hub clockwise by hand.
These few hints are intended to assist the 4008 ZM 2 owner's initial steps in amateur cinematography. They cannot claim to replace existing literature on the subject, intended for more advanced amateurs.

ENGLISH EDITION 1-1-72 Printed in France by Imprimerie FABRE - PARIS

Maison Brandt Frères 94-Charenton-le-Pont FRANCE R.C. Seine 54 B 7739